OCCASIONAL PAPER No. 66 August 9, 1937

SOUTHERN FOREST EXPERIMENT STATION

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FOREST INDUSTRIAL EXPANSION IN SOUTHEAST TEXAS - POSSIBILITIES AND DANGERS

by

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This paper releases data gathered in current investigations at the Southern Forest Experiment Station, and is subject to correction or modification following further investigation.

FOREST INDUSTRIAL EXPANSION IN SOUTHEAST TEXAS - POSSIBILITIES AND DANGERS 1/

By Robert K. Winters, Forester,
Southern Forest Experiment Station.

We see a great deal in the press these days about the conservation of natural resources. Oil, gas, coal, sulphur, forests, and game are frequently spoken of in the same breath without distinction. As a matter of fact, these natural resources fall into two distinct classes - nonreplaceable resources and renewable resources. Oil, gas, coal, and sulphur are examples of the former; forests and game are examples of the latter. These two classes of resources differ in that the renewable resources can be propagated by man within a comparatively short period, whereas the nonreplaceable resources require geologic ages for their formation.

Wise use of any renewable resource involves the consumption each year of only the annual accretion, leaving the growing capital intact. For example, no producer of beef cattle who expected to continue in business would consider selling all, or even 90 percent, of his herd. Rather, he maintains a herd of nearly constant size by selling practically all of his 2-year-olds and only the oldest of his breeding cows.

The forest resource is the raw material for certain industries supplying essential needs of men in the form of manufactured products and of income to both employers and employees. The ability of the forest resource in any locality to meet the continuous needs of the industrial plants drawing from it should be a very important factor in determining the location of new plants. Serious mislocation of plants with respect to continuing timber supplies is not only wasteful of capital, but because it results in migratory populations is also unsatisfactory from the standpoint of community development.

I have shown in the chart (fig. 1) the location of the existing and definitely projected pulp mills in the South. In all, 44 plants are shown. Of these, 11 are either still under construction or have been operating less than 18 months. After study of this chart, you may ask, "Were these new plants located after careful consideration of the ability of the forest to meet the needs of the proposed plants in addition to the already established forest industries?" I think the answer is, "No." As a matter of fact, Forest Survey data for southeast Georgia indicate that there is a serious threat of overcutting the forest after all the pulp mills now proposed swing into full production. This means that eventually some of the forest industrial plants will have to cease operation on account of lack of wood, and employees of these plants will have to seek employment elsewhere.

1/ Address delivered at Beaumont, Texas, before the Texas Academy of Science, June 26, 1937.

I hear that several locations in eastern Texas are being actively promoted as desirable sites for new pulp mills. What is the permanent producing power of your forests? And what is the nature and size of the existing industrial structure depending upon these forests for basic raw materials? The answer to these two key questions will go far toward determining the extent and the kind of safe forest-industrial expansion.

For the remainder of my discussion I shall confine myself to the area in southeast Texas bounded by the heavy black line (see fig. 1). This area comprises nearly 10 million acres. Approximately two-thirds is forested, and 13 percent is actually under cultivation. The timber volume on this forest area by the International $\frac{1}{4}$-inch log rule, which closely approximates green lumber tally, is $19\frac{1}{2}$ billion board feet, equivalent to nearly 85 percent of the total cut of lumber in the entire United States in 1936. This volume is in pine and cypress trees 9.0 inches and larger in diameter and in hardwood trees 13 inches and larger in diameter. The total volume on this forest area, expressed in cubic measure is $7\frac{1}{2}$ billion cubic feet. This cubic volume is in sound trees 5.0 inches and larger in diameter and includes the upper stems of pines and the upper stems and limbs of hardwoods to a 4-inch minimum limit. This timber volume, more than half pine, corresponds to the "herd" of the stock-raiser. It includes the calves, the 2-year-olds about to the sold, and the breeding stock. Safe industrial development will use only the accretion, maintaining the forest capital intact just as the stock-raiser markets only the increase in his herd.

To return to the first of our two key questions mentioned above: "What is the yearly accretion on this forest growing stock?" Or in other words, "How much can be cut each year without reducing its volume?" Figure 2 shows graphically for 1935 the total board-foot and cubic-foot forest increment classified as pine and hardwood and the corresponding forest drain. The pine increment was approximately 1 billion board feet or 272 million cubic feet, while pine drain against the forest was 618 million board feet or 128 million cubic feet. The hardwood increment was 264 million board feet or 121 million cubic feet, while the hardwood drain was 196 million board feet or 64 million cubic feet. Thus in 1935 the growth is seen to have been considerably in excess of the drain in both board feet and cubic feet. It is estimated that the 1936 drain was 18 percent greater than 1935, and the 1937 drain may possibly be 10 to 12 percent greater than the 1936 drain.

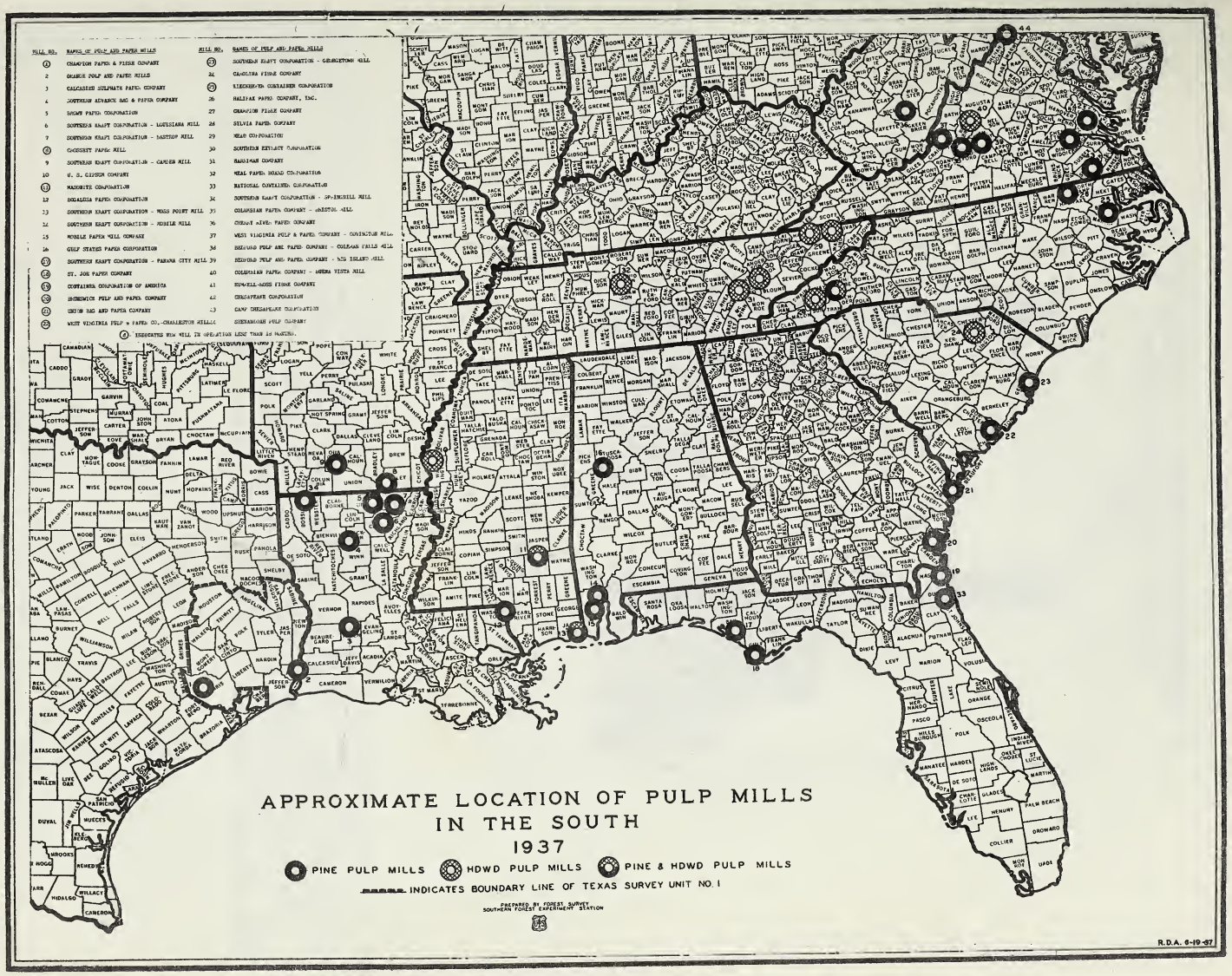
MILL NO. NAMES OF PULP AND PAPER MILLS
1 CHAMPION PAPER & FIBRE COMPANY
2 OLINKRAFT PULP AND PAPER MILLS
3 CALCASIEU SULPHATE PAPER COMPANY
4 SOUTHERN ADVANCE BAG & PAPER COMPANY
5 BROWN PAPER CORPORATION
6 SOUTHERN KRAFT CORPORATION - LOUISIANA MILL
7 SOUTHERN KRAFT CORPORATION - NATCHEZ MILL
8 CROSSETT PAPER MILL
9 SOUTHERN KRAFT CORPORATION - CAMDEN MILL
10 U. S. GYPSUM COMPANY
11 MAGNOLIA CORPORATION
12 ARKANSAS PAPER CORPORATION
13 SOUTHERN KRAFT CORPORATION - WEST POINT MILL
14 SOUTHERN KRAFT CORPORATION - MOBILE MILL
15 MOBILE PAPER MILL COMPANY
16 GULF STATES PAPER CORPORATION
17 SOUTHERN KRAFT CORPORATION - PANAMA CITY MILL
18 ST. JOE PAPER COMPANY
19 CONTAINER CORPORATION OF AMERICA
20 BROWNSWICK PULP AND PAPER COMPANY
21 UNION BAG AND PAPER COMPANY
22 WEST VIRGINIA PULP & PAPER CO.-CHARLESTON MILL
(C) INDICATES MILL WILL BE IN OPERATION LESS THAN 12 MONTHS.
MILL NO. NAMES OF PULP AND PAPER MILLS
23 SOUTHERN KRAFT CORPORATION - GEORGETOWN MILL
24 CAROLINA FIBRE COMPANY
25 ELECTRIC-X CONTAINER CORPORATION
26 HALIFAX PAPER COMPANY, INC.
27 CHAMPION FIBRE COMPANY
28 SYLVIA PAPER COMPANY
29 WEAR CORPORATION
30 SOUTHERN EXTRACT CORPORATION
31 HARRISMAN COMPANY
32 WEAL PAPER BOARD CORPORATION
33 NATIONAL CONTAINER CORPORATION
34 SOUTHERN KRAFT CORPORATION - SP-HINNIBAL MILL
35 COLUMBIAN PAPER COMPANY - HUNTSVILLE MILL
36 CHEMICAL WOOD PAPER COMPANY
37 WEST VIRGINIA PULP & PAPER COMPANY - COVINGTON MILL
38 BEDFORD PULP AND PAPER COMPANY - COLLEGE FALLS MILL
39 BEDFORD PULP AND PAPER COMPANY - NEW ISLAND MILL
40 COLUMBIAN PAPER COMPANY - MONTEA VISTA MILL
41 KIN-KELL-MOSS FIBRE COMPANY
42 CHESAPEAKE CORPORATION
43 CAMP CHESAPEAKE CORPORATION
44 SWEETWATER PULP COMPANY
APPROXIMATE LOCATION OF PULP MILLS
IN THE SOUTH
1937
PINE PULP MILLS
HDWD PULP MILLS
PINE & HDWD PULP MILLS
INDICATES BOUNDARY LINE OF TEXAS SURVEY UNIT NO. 1
PREPARED BY FOREST SURVEY
SOUTHERN FOREST EXPERIMENT STATION
R.D.A. 6-19-37

Figure 1

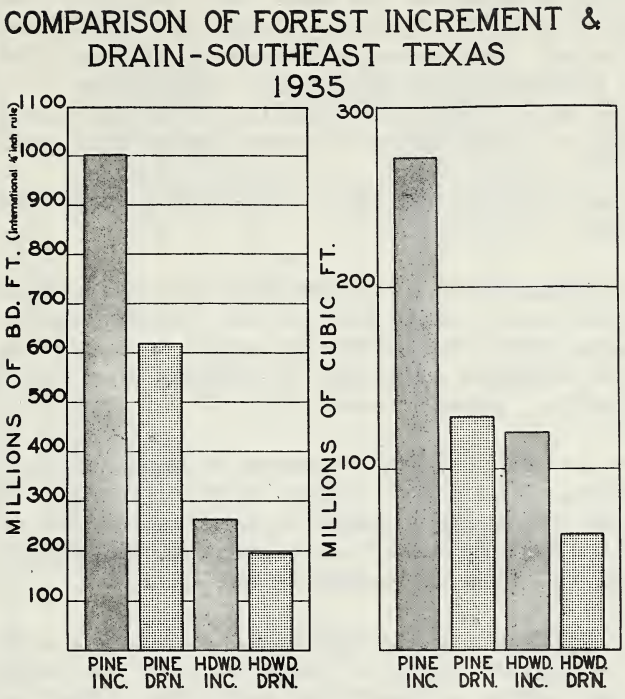

Figure 2

And now to the second of our key questions: "What is the nature of the forest industry that was responsible for the cutting of this timber?" In figure 3 is shown the approximate location of the larger forest industrial plants in southeast Texas. In all, 63 of the larger sawmills are shown (there being 112 additional small ones not shown), 4 veneer plants, 4 creosoting plants, 1 stave mill, 2 pulp mills, and 10 other miscellaneous wood-using plants.

In the light of the answers to these two key questions there is plainly an opportunity for expanding the forest industries in southeast Texas without risk of materially reducing the forest capital or growing stock. Even though the present forest industries increase production in 1937 as much as 30 percent over their 1935 production and hold this level for the next few years, there still would be sufficient timber growth to justify some expansion in wood-using industries. The question naturally arises, from the point of view of the long-time welfare of the people and communities of this area, "Should more pulp mills be built, more new sawmills be constructed, or should the timber consumption of other kinds of forest industrial plants be increased?"

A sound answer to this question hinges on a consideration of the following three points:

1. The comparative stumpage value per unit of wood volume of pulpwood, sawtimber, poles, veneer blocks, etc. Making this comparison is an aid in measuring the relative economic advantage in growing wood for pulpmills, sawmills, poles, veneer, etc.

2. The amount of labor required to manufacture a unit volume of wood into paper, lumber, veneer, etc. Industries requiring a large expenditure of labor per unit of volume of product are, other things being equal, more valuable as community builders.

3. The value added through manufacture of a unit volume of wood into paper as compared with the value of an equal volume of wood when made into lumber or other products. In general the greater the value added through manufacture, the greater will be the sum of money distributed in wages, purchase of supplies, plant maintenance, interest on investment, and dividends.

I shall develop each of these in turn, comparing items for lumber and paper production.

Present stumpage prices for pulpwood if purchased by the cord are usually quoted at 50 to 75¢ per standard cord in this area. (The U. S. Forest Service is asking $1.00 per cord for pulpwood from the National Forests in the South.) On the basis of 77 cubic feet of solid peeled wood per cord this wood is worth about 2/3 to 1¢ per cubic foot of peeled wood. Comparable stumpage prices for good pine sawtimber at $5.85 per M board feet is $3\frac{1}{2}$¢ per cubic foot. Accordingly, wood marketed for pulp sells for only 1/5 to 1/3 as much per unit of volume as when grown to a size and quality suitable for the manufacture of the better grades of lumber. Furthermore, most pulpwood is cut from trees less than 13 inches d.b.h. and at a stage in their development when they are probably making their most rapid growth. Thus pulpwood operators, cutting chiefly young timber, are removing trees at a time when they are about to make rapid growth and when their value per unit of volume under present conditions is relatively low. From the point of view of the average timberland owner, therefore, the growing of wood for pulp manufacture alone does not yield the maximum possible money return per unit of volume grown.

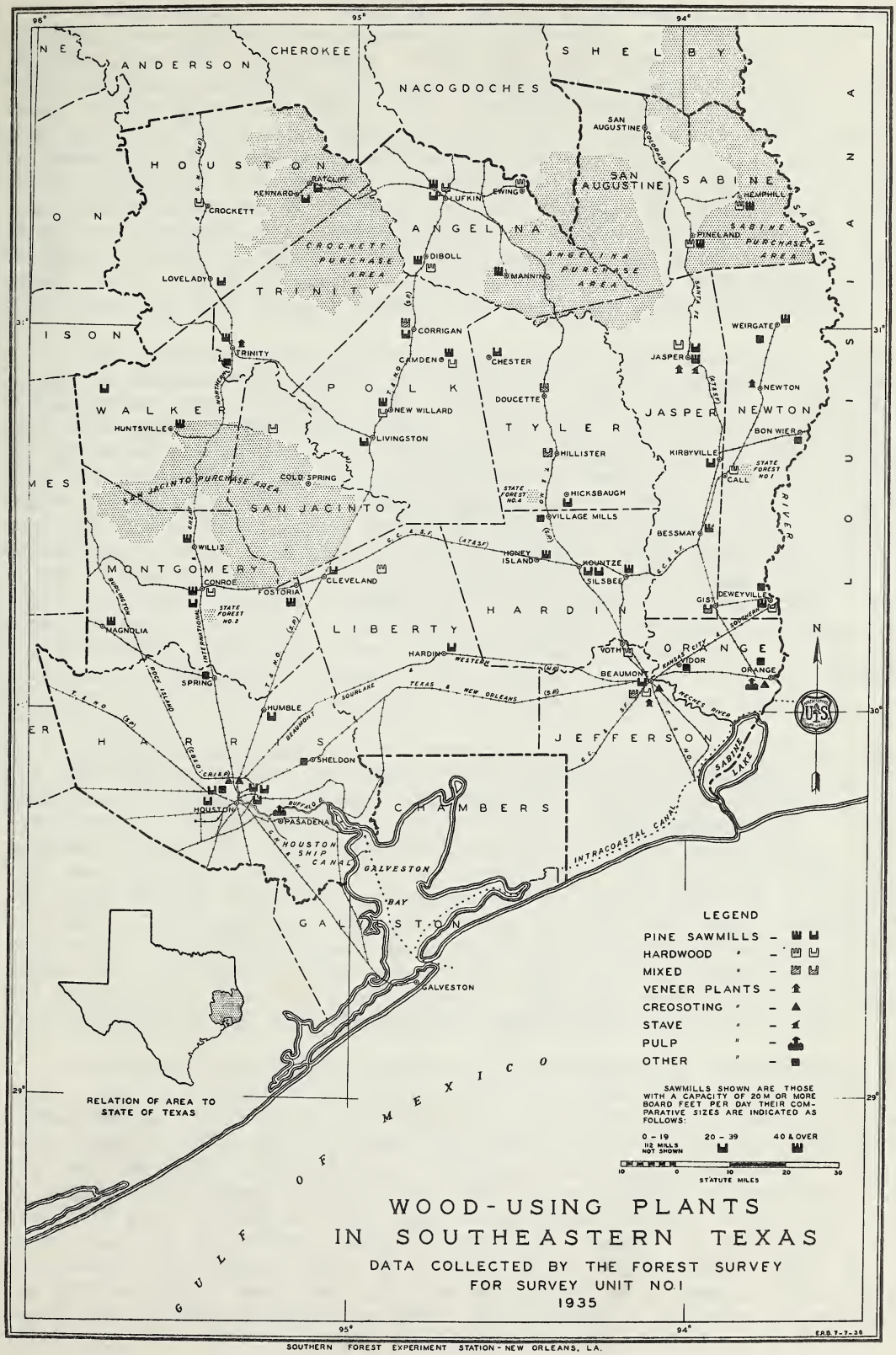
ANDERSON
CHEROKEE
NACOGDOCHES
SHELBY
SAN AUGUSTINE
SABINE
HOUSTON
ANGELINA
TRINITY
POLK
TYLER
JASPER
NEWTON
WALKER
SAN JACINTO
MONTGOMERY
LIBERTY
HARDIN
ORANGE
JEFFERSON
CHAMBERS
GALVESTON
CROCKETT
LUFKIN
EWING
DIBOLL
MANNING
LOVELADY
TRINITY
CORRIGAN
CAMDEN
CHESTER
JASPER
WEIRGATE
NEWTON
BON WIER
NEW WILLARD
DOUCETTE
LIVINGSTON
HILLISTER
KIRBYVILLE
HUNTSVILLE
COLD SPRING
HICKSBAUGH
VILLAGE MILLS
BESSMAY
WILLIS
HONEY ISLAND
KOUNTZE
SILSBEE
CONROE
CLEVELAND
FOSTONIA
DEWEYVILLE
GIST
MAGNOLIA
VOTH
HARDIN
BEAUMONT
ORANGE
SPRING
HUMBLE
SHELDON
HOUSTON
PASADENA
GALVESTON BAY
GALVESTON
SABINE LAKE
SAN AUGUSTINE
SABINE PURCHASE AREA
CROCKETT PURCHASE AREA
ANGELINA PURCHASE AREA
SAN JACINTO PURCHASE AREA
STATE FOREST NO. 1
STATE FOREST NO. 2
STATE FOREST NO. 4
INTRACOASTAL CANAL
HOUSTON SHIP CANAL
SABINE RIVER
LOUISIANA
MEXICO
GULF OF
RELATION OF AREA TO STATE OF TEXAS
LEGEND
PINE SAWMILLS –
HARDWOOD " –
MIXED " –
VENEER PLANTS –
CREOSOTING " –
STAVE " –
PULP " –
OTHER " –
SAWMILLS SHOWN ARE THOSE WITH A CAPACITY OF 20 M OR MORE BOARD FEET PER DAY THEIR COMPARATIVE SIZES ARE INDICATED AS FOLLOWS:
0 – 19
112 MILLS NOT SHOWN
20 – 39
40 & OVER
10 0 10 20 30
STATUTE MILES
N
U.S.
96°
95°
94°
31°
30°
29°
WOOD-USING PLANTS
IN SOUTHEASTERN TEXAS
DATA COLLECTED BY THE FOREST SURVEY
FOR SURVEY UNIT NO. 1
1935
ERS 7-7-36
SOUTHERN FOREST EXPERIMENT STATION - NEW ORLEANS, LA.

Figure 3

In the South, it is estimated that for an average mill approximately three 10-hour man-days are required to manufacture 1,000 board feet of standard, dressed, pine lumber. This labor requirement includes the employment necessary in cutting the logs in the woods, transporting them to the mill, sawing them into lumber, and drying and surfacing the lumber. Expressing this in terms of cubic contents, we find that the lumbermill labor requirement is 13.5 man-hours per standard cord (4 x 4 x 8 ft.) of wood with bark, containing 77 cubic feet of peeled wood. In contrast, the corresponding labor requirement of the southern pulp industry is estimated at 17 man-hours per standard cord. This includes the cutting and transporting of the billets to the pulp mill and the manufacturing of the pulp and kraft paper or paper board. It is apparent, therefore, that the wood-pulp industry uses more labor per unit of wood consumed than does the pine-lumber industry.

The current market price of southern pine lumber (average of all grades) is in the neighborhood of $32 per M board feet. If we assume that average second-growth pine stumpage sells at $3 per M board feet, this leaves $29 as the value added through manufacture. Converting this to standard cords, this is approximately $13 per cord. Assuming a stumpage price of 50¢ a standard cord for wood and an average current price for southern kraft paper of $95 per short ton (f.o.b. mill) and further assuming 1.5 standard cords of wood and bark per ton of kraft paper, the value added to a standard cord of wood by converting it into this type of paper is $62.83. Thus we see that the value added to the cost of wood in the manufacturing of kraft paper is about five times as great as the value added in the manufacture of pine lumber. This money is spent for wages, improvements in plants, interest on invested money, and dividends. Some part of it is spent locally, contributing to the support of grocers, clothiers, carpenters, and others; probably a smaller percentage is spent locally than in the case of the sawmill operation under consideration.

Comparing only the wood pulp and the lumber enterprises we find that for the same unit of volume the value of high-grade sawmill stumpage is greater than that of pulpwood stumpage, although paper manufacture requires a greater expenditure of labor and adds a greater value through manufacture. It is apparent, therefore, that each has advantages and that each can play an important part in the industrial life of a community. The question might be raised, "Are they hostile industries, competing in the same market for the same kind of wood?" The answer is: "Ordinarily they are not, but under pressure of need, pulp mills can cut the trees over a large area before they reach a size that makes them attractive to the lumber mill and thus force lumber mills out of the territory." There is a way, however, that each can be made to further the best interest of the other and to work together for the good of all.

The production of clear lumber requires that young timber stands be dense. Fastest growth on the trees that are ultimately to be harvested for lumber can be obtained only by thinning these dense young stands at proper intervals. Four or five of these thinnings may be made to yield pulpwood during the time that the final crop of sawlog-size trees is maturing. Cuttings of this kind in Europe indicate that the volume produced in periodic thinnings needed to grow a stand of pine trees to an average d.b.h. of 15 inches is about equal to the volume removed in the final harvest of sawlog-size trees. This means, for example, that if a stand in the South treated after this fashion yields 12,000 board feet per acre at the end of 50 years, it probably would have yielded during this period 25-30 cords of pulpwood per acre in thinnings.

Furthermore, in all stands there are defective, crooked, and partially rotten trees that ought to be cut and be replaced by good, thrifty seedlings. As a rule these defectives can be used as pulpwood with resulting improvement to the growing condition of the stand. In addition, generally some part of the tops of trees cut for sawlogs can be utilized for pulpwood.

Thus we see that it is definitely possible to integrate the pulp and paper industry with the industries already existing. On the other hand, there is the very real possibility that some pulp mills will cut chiefly thrifty, rapid-growing, young timber when it is about to enter its most productive stage, thus preventing the development of the high-grade raw material upon which other industries must depend.

These are the two extremes of pulpwood utilization possible throughout the southern pinelands. The successful handling of the situation requires, it seems to me, the organized effort of such groups as the Texas Academy of Science. This effort should follow two channels: (1) educating landowners, both large and small, in better ways to handle their woodlands in order to secure maximum growth and income through producing sawtimber, poles, piles, naval stores, and other forest products, along with their pulpwood; and (2) arousing public opinion to the point where it will insist that the establishment of pulp and other forest industrial plants be based on the ability of the forest to support them continuously. The Southern Forest Experiment Station will publish in the near future a comprehensive report on southeast Texas showing in detail the timber-growth possibilities of this area and the requirements of present industries. This report will be invaluable in planning wisely for the full and longtime use of the forest resources of the region.

Today, the outlook for forest industries in southeast Texas is indeed bright. You have a splendid, fast-growing, pine forest with a fairly well-balanced industry drawing upon it. A few more well-located pulp mills, properly utilizing the forest thinnings and tops of sawlog-size trees should improve the present industrial structure. On the other hand, too many pulp mills improperly placed and cutting young timber indiscriminately could go far toward destroying the valuable forest resource upon which some of your most important industries depend. In the end, it will be your problem, as East Texans, to determine what you will do. Will you handle your resources so that your industrial development will bring you <u>permanent</u> forest industries with all the privileges and values that accompany a stable community, or will your industries be merely <u>temporary</u> ones that will operate for a few years, deplete your forests, and then move to virgin territory, leaving behind as a public liability a stranded and destitute population with insufficient opportunity for employment and no hopeful outlook for the future?